CANDIDATE NUMBER.....

AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS

END OF SEMESTER EXAMINATIONS

NSLS208: IMMUNOLOGY

NOVEMBER 2023

LECTURER: MR G. MALUNGA

DURATION: 3 HOURS

INSTRUCTIONS

1. Write your candidate number on the space provided on top of each page
2. Answer **all** questions in sections A on the question paper.
3. Answer **all** questions in section B on separate answer sheets provided.
4. Answer any **3** questions in section C on separate answer sheets provided
5. The mark allocation for each question is indicated at the end of the question
6. Credit will be given for logical, systematic and neat presentations in sections B and C

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SECTION A: MULTIPLE CHOICE [40 Marks]

- **Answer all questions by encircling the correct response T for TRUE or F for FALSE for each statement in all the questions**
- **Each correct response is allocated half mark**

1. The following forms part of the second line of defence of the immune system

T F a) Plasma cells

T F b) Macrophages

T F c) Cerumen

T F d) Antibodies

2. Cells of the immune system include

T F a) Natural killer cells

T F b) Eosinophils

T F c) Dendritic cells

T F d) Macrophages

3. The following are secondary lymphoid organs

T F a) Thymus

T F b) Spleen

T F c) Lymph nodes

T F d) MALT

4. The spleen is responsible for

T F a) phagocytosis

T F b) destruction of platelets

T F c) proliferation of B cells

T F d) filtration of lymph fluid

5. An example of a physical barrier to infection is

T F a) skin

T F b) lysozyme in saliva

T F c) cilia in the respiratory tract

T F d) cytotoxic T cells

6. The following refers to the development of immune cells

T F a) NK cells develop from lymphoid progenitor cells

T F b) Mast cells develop from the lymphoid progenitor cell

T F c) Macrophages develop from the myeloid progenitor cell

T F d) B cells mature in the spleen

7. Mucosal immune tissues include

T F a) GALT

T F b) NALT

T F c) PALT

T F d) BALT

8. Natural killer cells

T F a) mediate ADCC

T F b) destroy cancerous cells

T F c) bind IgG

T F d) act as APC for T cells

9. The following refers to immunoglobulins

T F a) IgG has 4 subclasses

T F b) IgM has the highest avidity

T F c) IgD bind the complement

T F d) IgE is the least common immunoglobulin

10. Receptors associated with innate immunity recognize microbes by detecting

T F a) insulin.

T F b) pathogen associated molecular patterns (PAMPs)

T F c) Toll-like receptors (TLR)

T F d) complement.

11. The interaction between antibody and antigen can be detected by

T F a) agglutination

T F b) Polymerase chain reaction (PCR)

T F c) Rapid plasma reagin

T F d) precipitation

12. The T Cell Receptor

T F a) consists of α and β chains only

T F b) can also be secreted

T F c) act only as a receptor

T F d) doesn't have a constant region

13. The following are immunodiffusion methodologies

T F a) precipitation

T F b) immunoelectrophoresis

T F c) Ouchterlony disc assay

T F d) PCR

14. The following affect immunoassays

T F a) ionic strength of buffer

T F b) gel pore size

T F c) incubation temperature

T F d) strength of electrical current

15. The following tests are examples of immunochromatographic techniques

T F a) ELISA

T F b) TPHA

T F c) Rapid HIV

T F d) RPR

16. Regarding immunohistochemistry

T F a) Fluorescent substances are sometimes used

T F b) Enzyme label on antibody is reacted with a substrate

T F c) The direct method of immunohistochemical staining uses one labelled antibody

T F d) The indirect method of immunohistochemical staining uses one antibody labeled with avidin-biotin complex

17. Antibody titer refers to the:

T F a) Absolute amount of specific antibody.

T F b) Affinity of specific antibody.

T F c) Avidity of specific antibody.

T F d) Concentration of specific antibody.

18. Latex particles are commonly used in:

T F a) Agglutination tests.

T F b) Affinity chromatography

T F c) Affinity measurements

T F d) Adjuvants

19. A chromogen may be used in the following assays?

T F a) Direct immunosorbent assay

T F b) Indirect immunosorbent assay

T F c) Western blotting

T F d) All of the above

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20. The following assay(s) involve(s) separation of antigens by size on a gel, followed by diffusion and precipitation

T F a) Indirect immunosorbent assay

T F b) Flow cytometry

T F c) Double diffusion immunoassay

T F d) Immunoelectrophoresis

SECTION B [20 Marks]

Answer all questions on separate answer sheets provided

1. State one main function of each of the following cells of the immune system
   a) Mast cells [1]
   b) Macrophages [1]
   c) Dendritic cells [1]
   d) Neutrophils [1]
   e) Basophils [1]
2. State any 5 characteristics of innate immunity? [5]
3. What are the functions of antibodies? [5]
4. State the main stages of an ELISA. [5]

SECTION C [75 Marks]

Answer any 3 questions from this section on separate answer sheets provided

1. Give a detailed analysis of acute and chronic inflammation? [25]
2. Describe the production of monoclonal antibodies. [25]
3. Describe the process of phagocytosis. [25]
4. With the aid of labelled diagrams, describe the structure of MHC1 and MHCII molecules. [25]
5. Explain the principles of the following immunological techniques
   a) Immunochromatography. [10]
   b) Immunoelectrophoresis. [15]